# Environmental Assessment

# and

# Habitat Conservation Plan

for the

Issuance of an Incidental Take Permit
Under Section 10(a)(1)(B) of the Endangered Species Act

for

El Coronado Ranch, West Turkey Creek,
Cochise County, Arizona

U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021

8 April 1998

Title for Proposed Action: Environmental Assessment and Habitat Conservation Plan for issuance of an Endangered Species Act Section 10(a)(1)(B) Permit for incidental take of Yaqui chub (*Gila purpurea*) and other Rio Yaqui fishes for ranching and related activities on El Coronado Ranch and associated grazing allotments on West Turkey Creek, Cochise County, Arizona.

Unit of Fish and Wildlife Service Proposing Action: US Fish and Wildlife Service, Ecological Services Field Office, Phoenix, Arizona.

Legal Mandate for Proposed Action: Endangered Species Act of 1973, as amended, Section 10(a)(1)(B), as implemented by 50 CFR 17.22 for endangered species; National Environmental Policy Act of 1969, as implemented by 40 CFR 1500, *et. seq.*

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Applicant: El Coronado Ranch and Cattle Company (Josiah and Valer Austin), Star Route, Box 395, Pearce, Arizona 85625.

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# ENVIRONMENTAL ASSESSMENT

## 1.0 INTRODUCTION

The El Coronado Ranch and Cattle Company (Josiah and Valer Austin, Applicant) proposes to use surface water from West Turkey Creek (WTC), Cochise County, Arizona, to conduct ranching operations on property owned or leased (USDA Forest Service [FS] grazing allotment) by the El Coronado Ranch (ECR)(Figure 1). The Applicant intends to continue the current management and use of the ECR for the term of the Habitat Conservation Plan (Plan).

Historically, Yaqui chub[1/] and a Rio Yaqui form of longfin dace occupied parts of WTC now owned or leased by Applicant; both exist today. Aquatic habitats sufficient to sustain other Rio Yaqui species either disappeared with post-glacial drying or were otherwise inaccessible or of insufficient size to support additional species. With human-constructed ponds and other water-management structures, suitable habitat is now available for translocation of other species into the area. Arizona stoneroller, beautiful shiner, Yaqui catfish, and Yaqui topminnow, and the Chiricahua leopard frog are all eligible for such an effort. Planning is underway to release Yaqui catfish to ponds on ECR and San Bernardino National Wildlife Refuge. Such efforts will either contribute to recovery or reduce the need for listing. Four of the six species (chub, shiner, catfish, topminnow) are listed as either threatened or endangered. The species covered by the Plan are Yaqui chub, Yaqui catfish, and the Yaqui form of longfin dace (Plan Species). Only actions for the Plan Species are part of the proposed action and are analyzed here.

The Applicant wishes to further conservation efforts for and enhance recovery of fishes indigenous to the upper Rio Yaqui but is concerned that taking could occur during routine ranching operations. After reviewing the information submitted by the Applicant and other sources, the US Fish and Wildlife Service (Service) has determined that the proposed action would result in incidental take of Yaqui chub and Yaqui catfish. Incidental take of the Yaqui form of longfin dace will also be authorized, effective on the date of listing, if the Yaqui form of longfin dace is ever listed. The Applicant therefore is submitting the necessary 3-200 Form for a permit under Section 10(a)(1)(B) of the Endangered Species Act (ESA)[16 U.S.C. § 1534 (a)(1)(B), as amended, for incidental taking of federally listed fish species that now or may in the future occur under ranching or conservation actions. All anticipated take would occur on private land. The duration of the permit will be 25 years from the date of issuance.

[1/] Scientific names are provided in an Appendix.

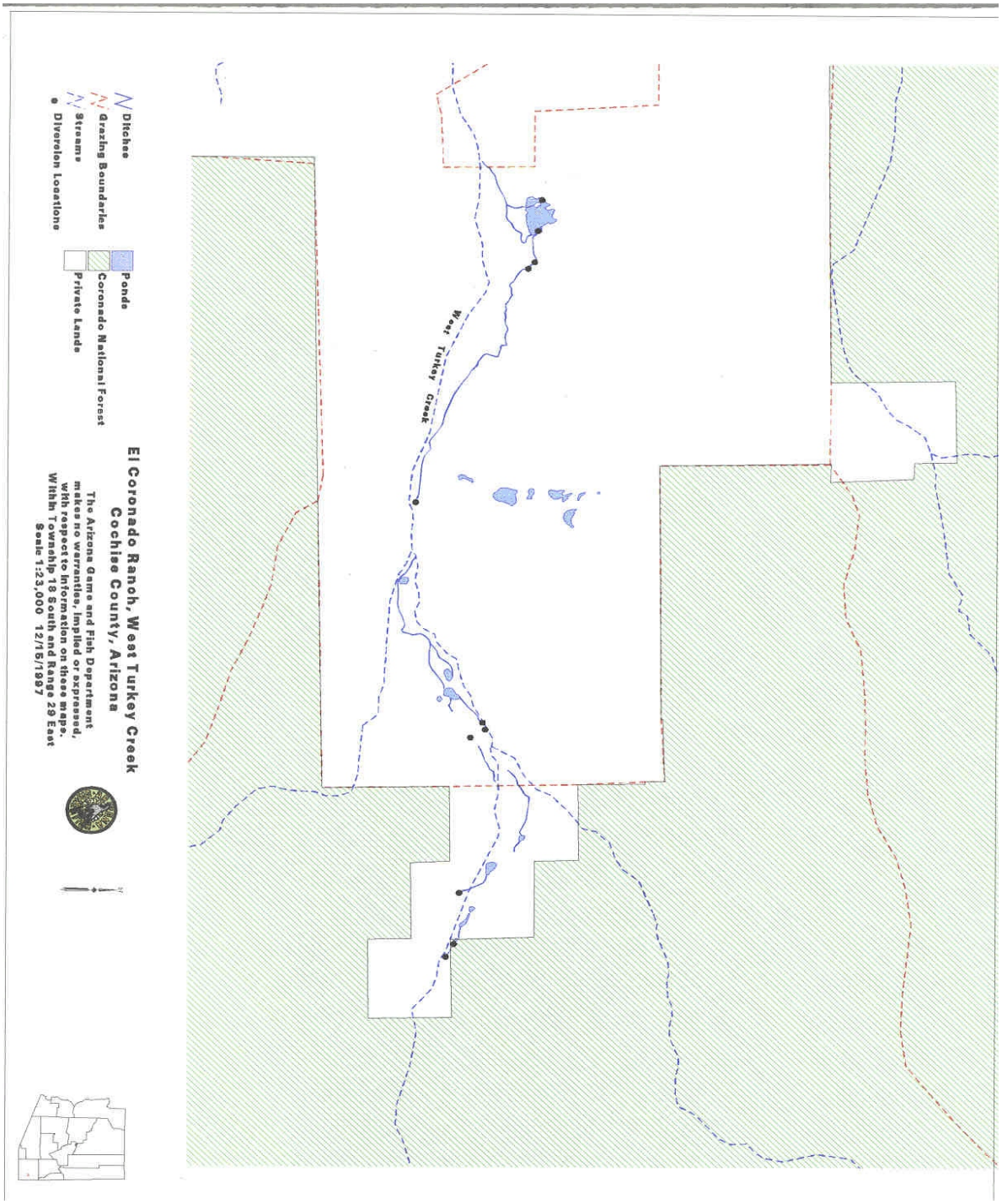


Figure 1. Map of El Coronado Ranch and environs, outlining the proposed HCP area and other features mentioned in text. Based on preliminary data derived from various digitized sources. Scale approximately 1.0 inch to 1.6 km. Map produced by AGFD.

Because the Applicant wants to further recovery of indigenous biota on land owned or leased by ECR, significant efforts have been or are being taken at the Applicant's expense to provide habitat and land management practices beneficial to listed species and to reduce the need to list additional species. This long-term commitment is expected to exceed losses that may accrue due to ranch and water-management actions required to operate the ranch and leased areas. In addition, these actions insure minimal impacts of taking from ranching and water management on the Yaqui chub and other Rio Yaqui fishes should they be translocated to the WTC watershed, and enhancement of their well-being in concert with the Yaqui Fishes Recovery Plan, approved and issued by the US Fish and Wildlife Service (FWS 1994). A primary objective of that Plan is to stabilize and reintroduce as appropriate Yaqui chub and other Rio Yaqui fishes in waters within their historic range in the USA. Justifications for including the now-endorheic Sulphur Springs Valley (including WTC) as part of the Rio Yaqui system are provided in the Recovery Plan, which embraces this basin as part of a broader, southeastern Arizona "Area of Ecological Concern" (FWS 1994:4-5).

Therefore, the goal of the present Habitat Conservation Plan (HCP) is to obtain a permit that will allow for incidental take of listed species with prescribed mitigation measures, development of a management plan, and implementation of such a plan. The HCP is designed to provide a conservation benefit to the Plan Species. Monitoring of incidental take, species populations, and habitats is an integral part of the HCP and is shared among the parties. Achieving the goal will provide the Applicant a permit for incidental take during management implementation and to expand the base EA/HCP to the entire WTC watershed, eventually bringing together as partners, land and wildlife management agencies and other individuals with their knowledge, experience, and potential funding resources. An incidental take permit will allow the Applicant to manage their livestock grazing operation and contribute to the conservation and recovery of the Plan Species. The incidental take would occur on private lands, while the mitigation, management, and monitoring would occur on private land and National Forest System lands. The EA/HCP was originally drafted by the Applicant. The EA was accepted by the Service and changes were made to the EA portion of this document. The HCP portion (Section 6) has been changed through negotiation with all parties. The EA is the Service's document and the HCP is the Applicant's document.

# 2.0 PURPOSE AND NEED FOR ACTION

## 2.1 PROPOSED ACTION

The proposed action is the issuance of an incidental take permit under Section 10(a)(1)(B) by the Service for the Plan Species, including the endangered Yaqui chub

(chub). The incidental take permit would also cover species that may be released on the ECR as part of conservation actions proposed in the HCP. Incidental take for the Yaqui form of longfin dace will be covered by the permit, with an effective date being the date of listing, if the Yaqui form of longfin dace is ever listed. Incidental take would only occur on private lands of the ECR. Plans are being made to release Yaqui catfish into ponds on ECR and San Bernardino National Wildlife Refuge. The issuance criteria for incidental take permits [50 CFR 17.22 (B)(1), 17.32 (B)(1), and 222.22] are:

- is the action that results in incidental take an otherwise lawful activity?

- are the impacts of the proposed taking minimized and mitigated to the maximum extent practicable?

- has the applicant ensured that proper funding will be provided to do the measures proposed in the HCP?

- is the proposed take such that it will not appreciably reduce the likelihood of survival and recovery of species in the wild?

- are there other measures that should be required as a condition of the permit, and does the HCP contain procedures to deal with unforeseen circumstances?

## 2.2 PURPOSE

The purpose of the proposed action is to authorize incidental take of chub and Yaqui catfish, including possible habitat modification in WTC associated directly or indirectly with operation, maintenance, and use of water facilities as part of a ranching enterprise. Incidental take of the Yaqui form of longfin dace will be authorized, effective on the date of listing, if the Yaqui form of longfin dace is ever listed. Authorization or denial is necessary because the Applicant has applied for a Section 10 (a)(1)(B) permit, since activities associated with the proposed action may result in take. Therefore, to conduct lawful business activities, the Applicant requires an incidental take permit to avoid conflict with the take prohibitions of the ESA.

Diversion of water from WTC is a necessary component of the ranching operation. Activities that could result in the incidental take for which permitting is requested include:

- diversion of water from WTC via existing diversion structures into existing ponds on ECR lands owned and operated by the Applicant;

- operation and maintenance of existing diversion structures, conveyance systems (ditches and settling basins), and stock-watering ponds as an integral part of the ranching operations;

- use of these water-management facilities both for cattle and for rearing and maintenance of Plan Species; and

- transport of Plan Species for recovery purposes in response to emergencies such as drought or invasion of non-native species.

In addition, the Applicant may stock Big Tank, the lower most, isolated pond with non-native, non-reproducing game fish, probably trout. Big Tank is isolated because it is the last pond on the system, and is fed by a mile-long ditch with no other ponds on it. The fish would be there for limited, private, recreational fishing. A barrier would be placed on the pond inlet to prevent non-native fish from moving upstream and slow the potential movement of Plan Species downstream. A barrier would also be placed at the pond outlet to restrict fish movement out of the pond. Having non-native fish in the aquatic system may result in incidental take of listed Plan Species. Any current or future Service policies which do or may apply to this HCP will be observed.

Agricultural diversion structures, and their operation and maintenance, are provided for under Section 404 of the Clean Water Act (33 CFR part 323) and water is legally diverted into ponds for stock watering using permitted or certified water rights recognized by the State of Arizona (Department of Water Resources).

This combination EA/HCP evaluates environmental impacts of the proposed action that may result in incidental take and delineates measures proposed to minimize and mitigate those impacts. Submission of the Section 10(a)(1)(B) permit application requires development of an EA/HCP (for the latter, see Section 6.0 of this document). Implementing regulations for Section 10(a)(1)(B) of the ESA, as provided by 50 CFR 17.22, specify the criteria by which a permit allowing incidental take of listed species following otherwise lawful activities may be obtained.

Incidental take will be minimal but difficult to quantify. Actual take is expected to be insignificant to recovery and maintenance of Yaqui chub, Yaqui catfish, and the Yaqui form of longfin dace (Plan Species) populations over the life of the proposed permit period. Anticipated kinds of take include:

- diversion of water from WTC, which may result in direct but more likely in-direct take of Plan Species. Direct take (*i.e.*, mortality) will be rare and consist of loss of a few individuals in natural habitat of WTC. Indirect take (through ha-bitat reduction

in WTC) would result only under severe circumstances such as drought, and may be compensated for by ponds and other artificial structures;

- maintenance of ditches and ponds could result in more significant direct take (accidental mortality at drawdown for repair or reconstruction);

- operation of ditches and ponds and their use by livestock could result in extremely low levels of take, or none; and

- non-native game fish may cause direct take by preying on listed fish. Also, Yaqui catfish may prey on other fish if they coexist. The likelihood of take occurring this way is low.

Requested duration of this Section 10(a)(1)(B) permit is for 25 years from the date of issuance. This authorizes the Applicant or their successors to incidentally take (including habitat modification) the endangered Yaqui chub, threatened Yaqui catfish, and the unlisted Yaqui form of longfin dace, should they become established within geographical boundaries identified in the HCP over that period. After expiration of this permit, any take within the delineated geographic boundaries requires reauthorization of the permit. Terms and conditions contained in the HCP do not, however, expire, and are covered by enforcement authority of Section 11(b) of the ESA. The duration of the HCP assurances is the same as the length of the permit. This document provides the required National Environmental Policy Act documentation for a federal action (Section 10(a)(1)(B) permit issuance) and the components of a HCP as mandated by Section 10 of the ESA.

In reaching a decision on the permit application, the Service may choose to issue a permit conditioned on implementation of the HCP as submitted by the Applicant, to issue a permit conditioned on implementation of the HCP as submitted with other measures specified by the Service, or deny the permit.

## 3.0 DESCRIPTION OF AFFECTED ENVIRONMENT

The critical elements of the human environment that may be affected by the proposed action are examined below. Those critical elements that will not be affected, such as Wilderness and Wild and Scenic Rivers, will not be examined.

### 3.1 PHYSIOGRAPHIC SETTING

Geographic area for the EA/HCP is depicted in Figure 1. The ECR private land includes part or all these Sections: T18S, R29E, Sections 8, 9, 14-17, 20. The ECR grazing allotment on Forest Service lands includes the following Sections: T18S, R29E, Sections

1, 10-14, 21-25; T17S, R29E, Section 30; T17S, R30E, Sections 31, 32; T18S, R30E. The ECR is on the northwest side of the Chiricahua Mountain range at elevations between 1652 m (5452 ft) above msl where WTC leaves ECR private land to a maximum of 2629 m (9854 ft) on Chiricahua Peak. In total (deeded plus grazing allotments), ECR includes 6153 ha (15,204 ac), 5376 (13,284 ac) on Coronado National Forest (CNF) and 778 (1920 ac) deeded. More than half the CNF land [2846 ha (7032 ac)] is classed as unsuitable for grazing. All the ECR is drained by WTC and its tributaries. The geographic area for the EA/HCP is depicted in Figure 1. Proximity to Mexico plus the diversity of habitats occurring in such a "sky island" ecosystem provides for the presence of many rare or otherwise imperiled species in the Chiricahua Mountains. Table 1 lists sensitive plant and animal species of Cochise County, Arizona. Those known or suspected to occupy the WTC watershed are marked.

## 3.2 VEGETATION

Terrestrial plant communities in the EA and HCP area vary from grasslands at low elevation through woodland and to diverse conifer forest at upper watershed boundaries (Brown 1994). As with a large part of the USA - Mexico borderlands, historically the area was heavily grazed by domestic livestock (Bahre 1991). At lower elevations, desert scrub expanded and grasslands deteriorated. Riparian and aquatic habitats were reduced to disturbed, disjunct remnants. Today's lowland vegetation none-the-less remains as a desert grassland, intermingled on drier sites with desert scrub.

Further up slope, grasslands merge into Madrean Evergreen Woodland and Chaparral, the former most common in the WTC watershed. These plant associations are dominated by evergreen oaks that progressively give way to Mixed Conifer stands at higher elevations. Grazing has affected these communities as well, with reduced ground cover promoting arroyo cutting. At the highest elevations, stands of pine and fir form closed canopies, beneath which little ground cover exists.

## 3.3 THREATENED AND ENDANGERED SPECIES

One listed aquatic species, the endangered Yaqui chub is affected by the proposed action, though the Yaqui catfish may be released soon on ECR. The unlisted Yaqui form of longfin dace is also a primary concern, since WTC supports the only known stock of this form persisting in the Sulphur Springs Valley. Its protection will reduce the need for additional action. Both species occupy WTC, ponds, and connecting waters on ECR and natural waters of the grazing allotment as well. Species of secondary concern are those in Table 1 found in the EA/HCP area, and other federally listed species that may occur under current or future circumstances that may be affected by actions implemented to benefit fishes of primary concern. The species of secondary concern are not specifically covered by the HCP.

Table 1. Sensitive species of Cochise County, Arizona compiled from data by the Arizona Game and Fish Department, FWS, and FS[3/]. Taxa known or suspected to occur in or next to the WTC watershed are marked with an asterisk (*). Where agencies applied different taxonomy, only one name is included.

| Scientific Name | Common Name | AGFD[4/] | FWS | FS |
|---|---|---|---|---|
| **PLANTS** | | | | |
| **Coryphantha robbinsorum* | Cochise pincushion cactus | [4/] | LT | T |
| **Erigeron kuschei* | Chiricahua fleabane | | S | S |
| *E. lemmonii* | Lemmon fleabane | | C | |
| *Lilaeopsis schaffneriana recurva* | Huachuca water umbel | | LE | E |
| *Penstemon discolor* | Catalina beardtongue | | S | |
| *Pherotrichis balbisii* | Huachuca milkweed vine | | | S |
| **Rumex orthoneurus* | Blumer's dock | | P | |
| *Senecio huachucanus* | Huachuca groundsel | | C | |
| *Spiranthes delitescens* | Canelo Hills ladies' tresses | | LE | E |
| **FISHES** | | | | |
| **Campostoma ornatum pricei* | Arizona stoneroller | WC | S | S |
| *Catostomus bernardini* | Yaqui sucker | WC | | |
| *Cyprinella formosa mearnsi* | Beautiful (Yaqui) shiner | WC | LT | E |
| *Cyprinodon m. macularius* | Desert pupfish | WC | LE | E |
| *Gila intermedia* | Gila chub | WC | C | S |
| **G. purpurea* | Yaqui chub | WC | LE | E |
| *G. robusta* | Roundtail chub | WC | S | S |
| *Ictalurus pricei* | Yaqui catfish | WC | LT | T |
| *Poeciliopsis o. occidentalis* | Gila topminnow | WC | LE | E |
| *P. o. sonoriensis* | Yaqui topminnow | WC | LE | E |
| *Rhinichthys osculus* | Speckled dace | | S | S |

Table 1. Continued.

| Scientific Name | Common Name | AGFD | FWS | FS |
|---|---|---|---|---|
| **AMPHIBIANS** | | | | |
| *Ambystoma tigrinum stebbensi* | Sonora tiger salamander | WC | LE | E |
| *Hylactophryne augusti* | Barking frog | WC | | 2 |
| *Rana blairi* | Plains leopard frog | WC | | 2 |
| **R. chiricahuaensis* | Chiricahua leopard frog | WC | C | S |
| *R. subaquavocalis* | Ramsey Canyon leopard frog | WC | C | |
| *R. yavapaiensis* | Lowland leopard frog | WC | S | |
| **REPTILES** | | | | |
| *Crotalus willardi obscurus* | New Mexico ridge-nosed rattlesnake | | LT | T |
| **Sceloporus scalaris* | Bunch-grass lizard | | | S |
| *Sistrurus catenatus* | Massasauga | WC | | S |
| **Thamnophis eques* | Mexican garter snake | WC | S | |
| **BIRDS** | | | | |
| **Accipiter gentilus apache* | Apache northern goshawk | WC | S | S |
| **Amazilia violiceps* | Violet-crowned hummingbird | WC | | |
| *Ammodramus bairdii* | Baird's sparrow | WC | S | S |
| **Buteo albonotatus* | Zone-tailed hawk | | | S |
| *Buteo nitidus maximus* | Northern gray hawk | WC | S | S |
| **B. regalis* | Ferruginous hawk | WC | S | S |
| **Coccyzus americanus occidentalis* | Western yellow-billed cuckoo | WC | S | S |
| **Empidonax fulvifrons pygmaeus* | Northern buff-breasted flycatcher | WC | S | S |

Table 1. Continued.

| Scientific Name | Common Name | AGFD | FWS | FS |
|---|---|---|---|---|
| *E. traillii extimus* | Southwestern willow flycatcher | WC | LE | E |
| *Falco femoralis septentrionalis* | Northern aplomado falcon | WC | LE | E |
| **F. peregrinus anatum* | American peregrine falcon | WC | LE | E |
| *Grus americana* | Whooping crane | | LE | E |
| **Haliaeetus leucocephalus* | Bald eagle | WC | LE | E |
| **Otus flammeolus* | Flammulated owl | | | S |
| **Rhynchopsitta pachyrhyncha* | Thick-billed parrot | WC | LE | E |
| **Strix occidentalis lucida* | Mexican spotted owl | WC | LT | T |
| **Trogon elegans* | Elegant trogon | WC | | |
| **MAMMALS** | | | | |
| *Antilocapra americana mexicana* | Chihuahuan pronghorn | WC | | S |
| *Canis lupus baileyi* | Mexican gray wolf | WC | LE | E |
| **Choeronycteris mexicana* | Mexican long-tongued bat | WC | S | S |
| *Felis yagouarundi tolteca* | Jaguarundi | | LE | E |
| **Panthera onca* | Jaguar (US population) | WC | LE | E |
| *F. pardalis* | Ocelot | WC | LE | E |
| **Leptonycteris curosoae yerbabuanae* | Lesser long-nosed bat | WC | LE | E |
| *Lutra canadensis sonora* | Southwestern river otter | WC | S | S |
| *Macrotus californicus* | California leaf-nosed bat | WC | | S |
| **Nasua nasua* | Coati | | | S |
| *Ovis canadensis mexicana* | Desert bighorn sheep | | | S |
| *Sorex arizonae* | Arizona shrew | WC | | |

Table 1. Concluded.

[3/] Status definitions of each agency

AGFD

**WC** - **Wildlife of Special Concern in Arizona.** Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Department's listing of Wildlife of Special Concern in Arizona (WCSA, in prep.). Species included in WCSA are currently similar to those in Threatened Native Wildlife in Arizona (1988).

FWS

**LE** - listed endangered, in imminent jeopardy of extinction
**LT** - listed threatened, in imminent jeopardy of becoming endangered.
**C** - candidate for listing, available information shows that listing may be appropriate
**S** - species of concern

FS

**E** - endangered
**T** - threatened
**P** - proposed
**S** - sensitive (population viability of concern).

[4/] AGFD maintains no listing of threatened and endangered plants.

Yaqui chub occurred historically in the WTC drainage (FWS 1994). The Yaqui chub was released onto ECR in 1986. The stock of these fish is originally from Astin Spring via Leslie Creek. The chub eventually dispersed from the ECR ponds into West Turkey Creek. The ECR ponds function and continue to function as a refugium and a source of chub for WTC.

Two Mexican spotted owl territories occur in the upper watershed. Spotted owls could potentially occur elsewhere on the allotment, but are not known to at this time.

Chiricahua leopard frogs occurred historically in the West Turkey Creek watershed. However, due to the presence of bullfrogs in the drainage, it is unlikely that Chiricahua leopard frogs still occur. Management actions taken to benefit the native fish may benefit Chiricahua leopard frogs if they still occur or if they were to be reintroduced.

Yaqui topminnow were recently reintroduced into waters of the ECR. They did not persist long. Altitudes of the HCP area are above what is considered topminnow habitat. The

other species displayed in Table 1 should not be affected by the proposed activities. Reintroduction of other Rio Yaqui fishes would promote conservation and recovery of listed species and could negate the need to list other species. Yaqui catfish would probably be the most likely to thrive in the ECR ponds.

Non-native fishes, including rainbow trout, fathead minnow, channel catfish, western mosquitofish, green and bluegill sunfish, and largemouth bass, along with two amphibians, the bullfrog and tiger salamander, have appeared or increased in numbers and distribution from pre-existing populations. These organisms can negatively impact native aquatic species. Some work has been directed toward control or removal of these organisms by ECR; more effort will be necessary.

In the summer 1994, the Rattlesnake Fire in the upper watershed on CNF land resulted in massive ash, soot, and sediment runoff with summer rains, which almost eliminated fishes and most other aquatic organisms from the stream and ponds. Ash and other accumulations required immediate maintenance of ponds from which fishes had already been eliminated. Native fishes reinvaded from unidentified refugia, and along with some non-native species are currently repopulating WTC, ECR ponds, and connecting waterways.

## 3.4 WETLANDS

Areas subject to jurisdiction under Section 404 of the Clean Water Act include those that fall at or below the "plane of ordinary high water" of waterways as defined by 33 CFR 323.2. This EA/HCP currently neither requires nor authorizes any new construction within the waterway as defined by the 1987 Corps of Engineers Wetland Delineation Manual.

## 3.5 LAND USE

The ECR private land and leased grazing allotment collectively comprise a working cattle ranch. Over the past several years the Applicant has restored the ranch and made improvements to the watershed and rangelands, both to enhance livestock production and ecosystem health. A Coordinated Land Management Plan for the ECR was completed in 1993 (FS; Appendix B). The plan covers livestock management on both the private lands of ECR and the FS Turkey Creek Allotment. The plan specifies livestock use, livestock management system, range improvements, and plan evaluation. The plan has the following objectives (paraphrased):

- Maintain and improve watershed condition through better range practices to achieve litter accumulation, increase water infiltration, prevent "sore" areas (Turkey Pen Corral, Bath Tub, trails), and continue to construct rock check dams to increase infiltration and slow sediment movement.

- Improve riparian areas by stabilizing banks, increasing diversity of riparian plants, and improving [tree] age classes through increased regeneration. Produce year-around water flow from springs and Turkey Pen and WTC streams with clean water.

- Maintain a workable ranch plan compatible to ECR operation, but also conducive to other uses (recreation, wilderness values, hunting, special uses; some uses are not allowed on ECR private lands).

Conservation projects have also emphasized protection and restoration of native fishes in both natural and artificial waters, as described elsewhere in this document.

Between 60 and 135 cattle are grazed on the ranch. The ECR adopted non-use (i.e. no cattle were grazed on the FS allotment) for resource protection in 1995. Cattle are rotated through deeded and FS pastures based on forage production, plant physiological needs, and National Forest "other uses". The intent is to improve forage production by using pastures at different times each year. The ECR reduces livestock numbers in drought years and is permitted to exceed a total of 66 animals on FS land in wetter years, but may not exceed 867 animal months (FS 1993).

The interrelated and interdependent action of livestock grazing is not specifically analyzed here. The authorization of livestock grazing on National Forest land is a federal action. Therefore, it will not be analyzed in this EA.

## 3.6 WATER RESOURCES

Aquatic diversity is far lower than the biotic diversity in terrestrial habitats. Bedrock is near the surface so runoff is rapid with little groundwater storage. Most drainage channels are ephemeral and even the mainstem of WTC becomes intermittent during drought that predominates between the typical, biseasonal periods of precipitation (winter and late summer). As in the past, water today is a scarce commodity and aquatic systems are thus in jeopardy from any major development such as increased recreation. Introductions of non-native aquatic species are currently impacting natural aquatic communities throughout the region and may be expected to intensify as development continues.

Excepting a few seeps in tributaries and on hillsides, the only natural surface waters on the ECR are in WTC. Baseflow varies from an estimated 0.15-0.35 $m^3$/min (0.09-0.21 cfs) during spring and autumn drought, declining to a few liters/min if drought is prolonged. About 6.5 kilometers (4.0 mi) of wetted channel persists on and upstream from ECR deeded land at such times; most summers, the stream is intermittent downstream. The creek responds quickly to summer rains. Following the Rattlesnake Fire, peak discharges (estimated from debris heights along the channel) exceeded 500 $m^3$/min (294 cfs). At

baseflow, the creek averages less than 0.5 m wide and 0.2 m (1.7x0.7 ft) deep except in occasional pools that may be 1-2 m (3-7 ft) wide, up to 10 m (33 ft) long, and perhaps 1 m (3 ft) in depth. The largest pools are upstream of the existing diversions on ECR deeded land.

There are five diversions on WTC. An estimated 4.6 km (2.8 mi) of permanently to intermittently flowing diversion ditches fill stock tanks on the stream terraces. These vary from 20-50 cm (0.7-1.7 ft) wide and 5-20 cm (2-8 in) deep, with deeper places at turnouts and occasional pool-like depressions. Both chubs and dace use these systems for dispersal and permanently occupy deeper and more permanent reaches. A total of 18 water retention structures and stock-watering ponds varying from less than 0.1 ha to 6.5 ha (0.2-16 ac) are fed by the ditch and diversion system or by runoff and seepage from surrounding hills. Total surface area for these ponds is about 25 ha (62 ac). When measured in the spring of 1997, the ponds covered 4.4 ha (10.9 ac). Five are large and deep enough (to 8.0 m) to sustain fishes through severe droughts. These ponds are maintained and used only for on-site livestock water. No agricultural irrigation, pumping, or diversion from ponds is practiced. The lower most pond, Big Tank, may be stocked with non-native, non-reproducing, game fish.

Watershed storage, thus available water, has been enhanced through watershed and riparian management and maintenance and development of aquatic habitats. Wetlands and high water tables within WTC terraces are now maintained in part by seepage from ditches and ponds, increasing reliability of portions of WTC during drought.

## 4.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Two alternatives, the projected effects of which are summarized in Table 2, were considered practicable, as follows:

- no action and
- direct issuance of a Section 10(a)(1)(B) permit (proposed and preferred).

Three additional alternatives, requested removal of the listed species from private property, formal petition for delisting or down listing of chub, and waiting for development of a regional HCP and for the Service to issue a Regional Section 10(a)(1)(B) permit, were explored but rejected.

Table 2. Summary of environmental effects of two alternatives examined concerning issuance of a Section 10(a)(1)(B) permit for the El Coronado Ranch and Cattle Company, Arizona.

| RESOURCE ISSUE(S) | NO ACTION | HCP IMPLEMENTATION |
|---|---|---|
| Terrestrial Vegetation | none | enhanced |
| Threatened & Endangered Species | none | enhanced |
| Take of listed species | unchanged | mitigated |
| Wetlands | none | improved |
| Land-use practices | none | improved |
| Water resources | none | improved |
| Air and water quality | none[5/] | none[5/] |
| Cultural resources | none[5/] | none[5/] |

[5/] Air and water quality and cultural resources are excluded from further consideration.

## 4.1 ALTERNATIVE 1 - NO ACTION

A no-action alternative assumes that operations and plans for habitat development and enhancement do not occur and no application for incidental take is processed.

## 4.2 ALTERNATIVE 2 - PROPOSED (PREFERRED) ACTION

The proposed (preferred) action is direct issuance of a permit to the Applicant under Section 10(a)(1)(B) of ESA, authorizing incidental take of Yaqui chub, Yaqui catfish, and the unlisted Yaqui form of longfin dace. The anticipated on- and off-site consequences of the proposed action are addressed in Section 5.2. A HCP has been developed (detailed in Section 6.0) as part of the proposed alternative to minimize and mitigate for incidental take of the listed fish. The HCP is habitat and ecosystem oriented, including provisions for habitat maintenance, managing grazing to minimize impacts, prevention and repair of adverse watershed modification, monitoring provisions, and cooperation among Applicant, agencies, and organizations involved.

The activities that could result in take for which this permit is being requested include:

- the diversion of water from West Turkey Creek via existing diversion structures into existing ponds on lands owned and operated by the Applicant;

- the operation and maintenance of existing diversion structures, conveyance systems, and ponds as an integral part of the livestock grazing operations of the ECR;

- the utilization of these water management facilities for use by cattle and for rearing fishes native to the Rio Yaqui system; and

- the introduction of non-reproducing, non-native game fish into Big Tank.

This alternative was selected as the proposed and preferred action, because it will allow continued ranching operations while offsetting potential adverse impacts to species of concern. The alternative further provides measures commensurate with and complementing or directly applicable to recovery actions delineated in the Yaqui Fishes Recovery Plan (FWS 1994).

## 4.3 ALTERNATIVES CONSIDERED BUT REJECTED

Three additional options were rejected as not viable except under conditions where Alternative 1, above, might prevail.

4.3.1 Request removal of chubs from private lands. This alternative does not support chub recovery from endangered status nor does it support enhancement to minimize needs for additional conservation actions for the Rio Yaqui form of longfin dace (dace).

It is further unacceptable due to the interest and dedication of the Applicant to conserving the indigenous biota.

4.3.2 Petition to down or delist. Since alternative criteria for down listing have not been met and delisting is unlikely in the future due to the chub's limited range in the USA (FWS 1994), it is unlikely that a petition to down list would be warranted.

4.3.3 Await regional HCP and Section 10(a)(1)(B) permit. The Applicant could wait for completion and implementation of a regional HCP and a regional Section 10(a)(1)(B) permit for operations and development on ECR. Such delay does not serve the best interests of the Applicant or the native biota. Development of a regional HCP is unlikely.

# 5.0 ENVIRONMENTAL CONSEQUENCES

## 5.1 ALTERNATIVE 1 - NO ACTION

This alternative assumes no application for incidental take is processed and no activities following that permit are undertaken. Water would continue to be diverted, ditches and control structures would remain in use, and ponds would be maintained for livestock watering. Incidental take would be avoided where possible, but might occur without a permit, which could jeopardize reasonable ranching operations and development. Actions to enhance and recover chub would be hampered by a lack of agreements about access, information exchange, and recovery actions. This alternative could result in restrictions on both land use and conservation.

## 5.2 ALTERNATIVE 2 - PROPOSED (PREFERRED) ALTERNATIVE

Issuance of a Section 10(a)(1)(B) permit will lead to implementation of a conservation strategy through a HCP, for chub and dace (on both private lands and leased area) by ECR and partners for maintaining and restoring populations in the WTC watershed. Other aquatic fauna, including the Yaqui catfish, indigenous to the Rio Yaqui basin may be restored to historic range. This strategy uses existing, off-stream ditches and ponds as refugia and rearing sites, grazing management, and watershed enhancement measures (*i.e.*, installation of sediment-trapping gabions on ephemeral channels) to improve both watershed and stream conditions. The strategy is compatible with step-down objectives 2.2, 2.4.3, 2.5, 4.4, and 5.4 of the Yaqui Fishes Recovery Plan (FWS 1994).

### 5.2.1 On-site Impacts

A few negative on-site impacts are expected. Those that may occur are anticipated to be minimized and mitigated by complete HCP implementation.

5.2.1.1 *Terrestrial Vegetation*. No displacement or reduction in terrestrial vegetation is anticipated; the reverse is expected. Minor losses of upland vegetation may occur during watershed restoration projects. Restoration may increase and stabilize upland vegetation in the future. Off-site watershed management actions are expected to increase habitat quality, enhancing fish habitat and the ecosystem.

5.2.1.2 *Wildlife*. Displacement or other adverse impact on terrestrial wildlife is not expected. Again, the reverse will be the case. Increased aquatic, semiaquatic, and riparian habitats on ECR will provide additional high-quality living space, forage, and other features to enhance plants and animals. The management and creation of riparian habitats will benefit terrestrial wildlife species as well as aquatic ones.

5.2.1.3 *Threatened and Endangered Species*. The net effect to affected fishes will be beneficial, although some individuals may be lost to predation by non-native game fish and Yaqui catfish, during water manipulations, and other operations and other individuals may leave ponds and perish in ditches or the drying creek during times of drought. Some impacts are beyond the control of the Applicant. As demon-strated, however, direct impacts of ponds and interconnecting ditches and indirect effects of raised water tables in terraces (thus enhanced baseflow in WTC) are posi-tive, notably increasing the size and permanence of fish habitat and providing valuable refuge and living space for listed and other species. Implementation of conservation and mitigation actions detailed in Section 6.0 (below) should minimize potential on-site impacts. The release of additional native species should not affect the functioning of the aquatic ecosystem. The system has low species diversity, except for non-native, non-reproducing species, which should be removed. Purposely introduced non-native species will be sterile and will be placed in the most downstream pond.

Changes in the upland and riparian vegetation will be on a relatively small scale. Mexican spotted owls will probably not be affected by these vegetation changes. The owls might experience minor benefits from improvement in the health of the vegetation and associated prey species.

5.2.1.4 *Assessment of Take*. On-site incidental take is anticipated to result from direct and indirect mortalities due to management actions and resulting changes in habitat conditions. Incidental take will be difficult to detect for the following reasons: dead fish are difficult to find, cause of death may be difficult to determine, reliable population estimates are not obtainable due to sampling difficulties, and losses may be masked by seasonal fluctuations in numbers or other causes. In addition, the variable nature of WTC and the ponds and ditches on ECR, and the 25-year duration of the permit, makes incidental take difficult to determine accurately. Therefore, the total take is indeterminable for the Yaqui chub, Yaqui catfish, and Rio Yaqui form of longfin dace. The causes and forms of take are described below.

**Diversion of Water:** Diversion of water from WTC via five existing structures into existing ditches and ponds on lands owned and operated by the Applicant reduces flow in the WTC channel. Diversion is, however, typically during periods of high runoff (*e.g.*, spring runoff, monsoon-derived floods), and is minimized during periods of low base flows (pre-monsoon, post-spring runoff and other drought) when the stream is most susceptible to habitat loss. Thus, there is the least effect on fishes during critical, low-discharge periods. Water diversion may nonetheless adversely affect individual fish stranded by intentional or unintentional withdrawal that reduces water levels. Water diversion may also negatively influence fish biology by reducing available habitat. Also, fish may be injured or killed at the diversions or other water control structures. The take of Yaqui chub, Yaqui catfish, and Yaqui form of longfin dace from injury, harassment, and kill is indeterminable.

**Maintenance:** Maintenance of water diversion structures is limited, when possible, to periods of low WTC discharge, when diversions are not in use. Ponds rarely undergo maintenance. Ditches are cleaned periodically to remove sediment. Individual fish may be harassed or lost, however, during maintenance and repair of diversions and interconnecting ditches and ponds, and from alterations in quantities and qualities of water. Exact numbers of fish subject to take due to physical injury, ditch diversion, and habitat loss during routine water-system operations is difficult to calculate. Take will be measured by how much maintenance is done on the ponds and ditches annually. The anticipated level of incidental take will be considered exceeded when maintenance is done on more than 6.5 acres of ponds and 0.5 miles of ditches in one calendar year. Maintenance done in an "average" year is considerably less. Maintenance may be done on all stream diversions and water gates in a calendar year, without incidental take being exceeded. Use of ponds for livestock watering should result in little take. An accurate estimate of take is difficult to determine because of the reasons specified above. Therefore, take of Yaqui chub, Yaqui catfish, and Yaqui form of longfin dace is indeterminable.

**Species Reintroduction/Introduction:** The purposeful introduction of non-reproducing, non-native game fish by ECR into Big Tank may lead to take through predation or competition. Take may occur if listed species make their way downstream into Big Tank or if the non-natives escape Big Tank into listed fish habitat. Take may be relatively high when the Plan Species have high reproduction, and take may be functionally zero in years of low reproduction. Because of this and the factors listed above, the exact take of Yaqui chub, Yaqui catfish, and Yaqui form of longfin dace is indeterminable. The introduction of Yaqui catfish should lead to similar amounts of incidental take.

Other causes of take, either on- or off-site, may result from additional introductions of non-native species or Yaqui catfish, either purposefully or through negligence, or because of expansion of populations already present. This form of take is generally beyond the control of the Applicant. This is a current problem since many non-native species survived the Rattlesnake Fire and are expanding. As undesirable populations increase, they take a large toll on chubs and dace. The need to remove or otherwise act against non-indigenous species will further result in incidental take of Yaqui chub, Yaqui catfish, and Yaqui form of longfin dace.

Emergencies could therefore result in far greater take than occurs during a "normal" year. Under special circumstances, for example, in the face of explosive spread of a newly introduced non-native species into a habitat of the HCP area, moving rapidly to eradicate the pest may be necessary before other parts of the system are infested. In the process, many Yaqui chub, Yaqui catfish, and Yaqui form of longfin dace also may be destroyed. If renovation actions become necessary, backup populations representing at least 50% of total estimated numbers (including individuals estimated to contain all known genetic

diversity) will be demonstrated as already present in other, uncontaminated habitats, or will be established, before eradication proceeds.

Also, before renovations occur, every effort must be made to remove Plan Species and other native species to another location. Plan Species may be moved to other, uncontaminated waters on ECR, into temporary holding facilities for later reintroduction, or to other locations agreed upon by the HCP parties.

Therefore, all Yaqui chub, Yaqui catfish, and Yaqui form of longfin dace in a contaminated pond or ditch will undergo some form of take. Plan Species moved to another location suffer take by harassment, and Plan Species that remain will be killed during renovation.

The significance to species survival and recovery of numbers of chub taken by an action must be placed in perspective by examining the species of concern, its historic resiliency, and its population size and dispersion. The chub has proven highly resilient (DeMarais and Minckley 1991, 1993). Populations expand rapidly from a few tens to thousands of individuals in a matter of weeks or months. Large, viable populations of chub have established themselves almost everywhere recovery reintroductions have occurred, with far more success than other species (Hendrickson and Brooks 1991; Minckley 1995).

Additionally, the chub persists for long periods under severe conditions, and rebounds dramatically when conditions improve. Thus, hundreds could be lost during a cata-strophe such as pond failure due to flood or other circumstances, sustained drought, or extensive fire, and yet be expected to re-establish so long as adequate refugia exist. Thousands were lost through suffocation or poisoning when runoff carrying ash and other materials from the Rattlesnake Fire swept through the system. Both dace and chub recruited in ponds of the WTC watershed immediately after that event. Thus, most losses, even of a catastrophic nature, are not anticipated to extirpate the population. Rather, throughout the life of the HCP, efforts will insure that refugium stocks persist even in the face of a major natural catastrophe in the action area.

5.2.1.5 *Wetlands*. Limited wetlands associated with interconnecting ditches and ponds will be maintained and enhanced. Impacts associated with proposed management actions will be temporary but recurring.

5.2.1.6 *Geology/Soils*. Significant geologic alterations are not expected. Surface alterations of soils will be positive due to greater soil and water retention resulting in greater organic matter accumulations.

5.2.1.7 *Land Use*. There are no planned or expected major changes in use of ECR or its grazing allotments in the future.

5.2.1.8 *Water Resources (including water quality)*. Quantity of water retained in the WTC system is expected to increase. Ponds serve to maintain high water tables on terraces and increase system water storage. Diversions into and out of ponds create wet meadows, obviously promoting groundwater recharge and surface habitat diversity. The reach of permanent flow in WTC has already increased over the past decade with improved watershed management.

Water quality in WTC has also been enhanced by increased sediment entrapment above water-retention devices, as well as by infiltration through those sediments and flood plains. WTC often clears quickly after spates and remains clear with "healthy" algae, invertebrate, and fish populations except following catastrophes such as the Rattlesnake Fire. Ash, toxic materials, and silt input to the stream and interconnecting waters resulted in suffocation, poisoning, and death of plants and animals alike. At present the system is recovering, although silt and other inputs from the burn far exceed those of pre-fire conditions.

5.2.2 Off-site Impacts

Since the EA/HCP area includes essentially all private and leased lands from the uppermost watershed boundaries of WTC, off-site impacts are those that may occur downstream or conceivably in other, more distant watersheds. Limited adverse impacts are anticipated.

5.2.2.1 *Vegetation*. Off-site impacts on vegetation are expected to be positive. Rock gabions on tributary washes result in increased soil retention, greater grass production, extensions of range of riparian plants and development of intermittent flow in formerly ephemeral washes. These benefits should progressively translate downstream due to greater stability and storage capacity of the upstream watershed.

5.2.2.2 *Wildlife*. No negative impacts to off-site wildlife are expected downstream from the EA/HCP area.

5.2.2.3 *Threatened and Endangered Species*. The net, off-site impacts of this action may be negative for individual fishes. However, overall population-level impacts are expected to be neutral or beneficial. As population sizes increase toward recovery under successful management, some fish will move downstream from the EA/HCP area during high or normal flow to be lost during drought (see Section 5.2.2.4).

5.2.2.4 *Assessment of Take*. Most off-site take is anticipated as a result of two major areas: 1) diversion of water and associated impacts within the HCP area to WTC downstream from ECR; and 2) expansion of habitat and actions that influence upstream habitat conditions and fish populations downstream.

As off-site populations increase, direct and indirect take in lower WTC may be expected if Plan Species populations expand downstream where they are subject to habitat desiccation due to removal of water through diversion and concomitant reduction of discharge and habitat diminution downstream. The Applicant's pattern of diversion of water from WTC is generally restricted to times of elevated discharge and has a minimal effect on habitat and fishes during critical low-discharge periods (see Section 5.2.1.4), but may nonetheless influence the system. Even without diversion, natural drying of WTC downstream from the HCP area may be anticipated. Increased reliability of water supply in the upper watershed will maintain large residual stocks to compensate for such downstream losses. Estimates of taking by such an occurrence are beyond the scope of this EA/HCP. In addition, take from this action is indeterminable due to the uncertain downstream effects of the conservation plan. Climatic patterns are beyond the control of the Applicant. It is conceivable that extension of partnerships downstream will contribute to recovery and allow such downstream chub populations to be translocated upon onset of drought conditions.

Recreation may also result in take of expanded populations in upper WTC. Recreation outside ECR deeded land is beyond the Applicant's control. On ECR, public fishing is controlled, is minimal, and will be further reduced as most non-native species are removed. No restrictive legislation other than rules against baitfish use and harvest is anticipated. Limitations on use of soaps and other chemicals in surface water and attention to possible discharge or seepage of wastes from summer homes and recreation sites into the extremely limited habitat and aquatic ecosystem may be necessary or desirable.

5.2.2.5 *Wetlands*. Negligible impacts to limited off-site wetlands are expected.

5.2.2.6 *Geology/Soils*. No negative impacts to off-site geologic or soil resources are expected.

5.2.2.7 *Land Use*. No significant alterations to existing or proposed off-site land uses are anticipated.

5.2.2.8 *Water Resources (including water quality)*. No negative impacts to off-site water resources are expected to occur. The reverse is in fact anticipated (see also Section 5.2.1.8). There should be discernible enhancement of stored and thus avai-lable groundwater due to water-retention structures in the watershed, ponds, intercon-necting ditches, and associated wetlands on terraces, and improved vegetative cover.

5.2.3 Cumulative Impacts Analysis

Other than those aspects of the present project delineated in Sections 5.2.1 and 5.2.2 (above) there are no present or future private projects, authorized or under review

expected to contribute to any cumulative losses to species of concern. The present project is judged to have a net positive cumulative impact on chub and other species of concern that may occur under current and future circumstances on ECR, as well as on the WTC watershed and its environs on adjacent public lands.

Activities that presently occur on the FS portion of the watershed include dispersed recreation, leased summer homes, livestock grazing, and campgrounds. The Coronado National Forest has not renewed some existing summer homes in other parts of the Forest. The FS is aware that the campgrounds may be contributing excess sediment to the watershed. However, funding to address the issue is not available. Human population growth in the area and increased demand for recreation will only exacerbate the situation. The livestock grazing on the Forest has not undergone Section 7 consultation. A watershed management plan which addresses most uses on the Forest would be a good tool for addressing the impacts and issues, allowing public input, and providing for NEPA and ESA compliance.

# HABITAT CONSERVATION PLAN

## 6.0 HABITAT CONSERVATION PLAN

The purpose of this HCP is to protect and enhance the West Turkey Creek watershed and habitat for Plan Species on the ECR, which could be complemented by actions taken on the FS allotment, while allowing for traditional use of the land for ranching. There are no development plans for the ECR property and the Applicant fully intends to execute conservation easements or other legal restrictions to preclude any development of the property for other commercial or subdivision purposes.

The Applicant is committed to maintaining the entire ranch in its current status and is not applying for a Section 10 permit for mitigating any proposed development now or in the future. The Applicant is concerned about the need for proper management of the WTC watershed including the area within the National Forest, and the need to preclude possible adverse impacts on the Plan Species from land use and management changes that could occur there in the future. Thus, the FS is an important participant and partner in the HCP so that management activities in the National Forest portion of the watershed also protect and enhance Plan Species recovery.

As part of the preferred action, an HCP is proposed to minimize and mitigate potential take described in Section 5.2.1.4 above. The HCP provides actions to minimize and mitigate any incidental take, and assure that the proposed action does not appreciably reduce the potential for survival and recovery of the chub, catfish, and longfin dace in the wild as required by 50 CFR Part 17.22(b)(1)(iii). The length of the permit would be for 25 years. Under the HCP, the Applicant will assist recovery as delineated in part by the Yaqui Fishes Recovery Plan (FWS 1994) by providing secure and enhanced habitat for continued existence and repopulation of species of concern on ECR lands and allotments by undertaking the following mitigation. It is recognized the Applicant is not responsible for and cannot preclude the possibility of an unanticipated act of nature or other disaster causing losses of species or populations over which the Applicant has no control; this disclaimer of the Applicant's responsibility applies to all provisions of the HCP (see also Section 6.8).

The Applicant will:

- Manage diversions to maintain a balance of water supply in both West Turkey Creek (WTC) and ponds on ECR to enhance survival of Plan Species.

- Perform routine maintenance at Applicant expense on all components of the water-delivery system and ponds on ECR to ensure they remain in good repair.

- Maintain water levels and biological conditions in ponds where fishes of concern are located to ensure adequate habitat to the extent possible given the variable water supply from WTC. To the extent possible, avoid reintroduction of and eliminate non-indigenous predators and competitors of resident populations of chub and other species of concern.

- Implement plans that minimize adverse impacts of livestock grazing in the watershed on native fish habitat or indigenous fishes.

- Avoid adverse modifications to the watershed on private land that may negatively impact native fish habitat or indigenous fishes.

- Allow Agency personnel access to ECR on reasonable notice where necessary for monitoring, sampling, research and other activities including translocation and reintroduction of fishes, when related to management of species and habitats of concern.

## 6.1 WATER DIVERSION

Diversions will be managed to maintain a balance of water supply in both West Turkey Creek and ponds to promote survival of the Plan Species. The Applicant will maintain when possible, water levels and biological conditions in ponds where fishes of concern are located to ensure adequate habitat, dependent upon environmental conditions beyond their control. Grazing, vegetation, and watershed management actions implemented by the Applicant at ECR expense to stabilize tributary channels on both private property and leased lands are being reflected in stabilization of sediments of the watershed, minimizing sediment loads in WTC. In time, stabilization will improve habitat quality in WTC and increase the opportunity to divert water during periods of higher discharge.

## 6.2 ROUTINE MAINTENANCE

Routine periodic and as-needed maintenance of all components of the ECR water-utilization system, diversions, interconnecting ditches, ponds, and outflow structures and channels will ensure that all are in good repair, so fishes would not be imperiled. This maintenance will be done at ECR expense on ECR. Water levels in ponds will be maintained insofar as possible to protect existing populations, and shutoff and other manipulations in ditches will be performed in a way to allow transient and resident fishes to reach refuge areas.

In situations where drying or other conditions, either natural or artificial, cause the probability of extirpation to be high, ECR will contact partners in the HCP (Arizona Game and Fish Department [Department], FWS, FS, and others) to help relocate fishes from

ponds and ditches in a way that will insure population size and genetic variability are maintained within the system. The Applicant's efforts and costs for this maintenance program are considered an in-kind contribution to security, maintenance, and enhancement of habitat toward recovery of chub, dace, catfish, and other species that occur under current or future circumstances.

## 6.3 PROVISION OF SUFFICIENT HABITAT AND HABITAT CONDITIONS

Along with routine habitat maintenance (Section 6.1), all efforts will be made to: 1) maintain water levels and other conditions in artificial habitats to ensure maintenance of adequate nutrients, water quality, and biological requirements; and 2) prevent habitat and ecosystem degradation that might negatively impact existing and future fish populations. Such efforts will continue until they become impossible because of drought or other reasons beyond control of the Applicant. Ponds on the ECR serve as significant habitat and as refuges for both chub and dace, and can provide sources of natural repopulation to WTC (via spillage from ponds) and for purposeful repopulation of WTC or other sites as instigated and agreed upon by agency partners.

Elimination of non-indigenous fishes and reduction of other non-indigenous animals that potentially act as competitors or predators has been and will be pursued to enhance habitat values of ponds, which represent the single largest source of available surface water in the WTC basin during drought. The ponds provide additional surface area of pooled water (preferred habitat for the chub), absent non-native species. This allows enhanced population sizes of chubs and dace which leads to greater population resilience. Without refuge provided by artificial ponds, large, healthy, and geographically dispersed populations of species of concern will likely not persist in the WTC watershed.

## 6.4 GRAZING CONCERNS

The current grazing plan agreement (FS 1993) already limits the adverse impacts of livestock grazing on riparian and aquatic habitats within the ECR. Potential need for modification of the grazing plan will be addressed following signature of this HCP and implemented, if applicable, when acceptable protocols have been devised and approved. Applicant agrees to confer with the FS, Department, Service, and external advisors as appropriate on development of any modified plan and to review grazing operations with concerned agencies and individuals regularly. The Forest Service will continue to implement the current grazing plan, which complements the activities identified in the HCP.

## 6.5 PREVENTION OF ADVERSE WATERSHED MODIFICATIONS

A major goal of the Applicant is to preclude adverse modifications of the watershed that may negatively impact Plan Species and their habitats. Four major areas of concern exist:

- existence of pressing needs for prohibition and application of means necessary to preclude introduction and establishment of non-indigenous species within the ECR and WTC watershed, and facilitate removal of existing populations. However, non-reproducing, non-native game fish may be stocked into Big Tank;

- examination of current and future changes in water quantity and quality related to recreation, expanded recreational development, and other actions on federal lands require examination;

- continued examination and evaluation of grazing practices on private land and Forest Service allotment (see Section 6.4); and

- increased cooperation in wildfire fuel and fire management on private and federal lands.

Applicant agrees to and requests discussions to begin relative to these four concerns, individually between the Applicant and the concerned agency representatives, then collectively among partners in the HCP, to identify and define perceived and actual problems and to seek equitable and lasting solutions.

## 6.6 NATIVE SPECIES MANAGEMENT

The Yaqui catfish may be reintroduced into ECR ponds. In addition, Yaqui chub may be augmented to bolster existing populations for other management considerations (*e.g.* genetics). Reintroduction of Yaqui catfish will be considered after permit issuance, as the schedules and funding of all parties allow, and subject to approval by the appropriate parties. Reintroduction of other species may require additional NEPA compliance, HCP and permit amendment, and ESA compliance.

## 6.7 MONITORING PROVISIONS

The objectives of the monitoring program are:

- monitoring populations of species of concern to insure that viable populations are maintained;

- monitoring habitat to insure that it meets species needs and that it supports a properly functioning ecosystem;

- monitoring during actions that may cause take to insure that anticipated take is not exceeded and that the minimization actions are effective;

- how to respond to threats to the Plan Species and emergencies such as drought and invasion by non-native species.

A monitoring plan will be written by the Department and Service, reviewed by the Forest Service, and approved by the Applicant. The monitoring plan can be changed over time, with the agreement of all parties, without the need to amend the HCP, Implementation Agreement, or Section 10(a)(1)(B) permit.

Monitoring of fish populations and habitat conditions on private lands of ECR will be performed by professional fishery biologists and coordinated with comparable and concurrent monitoring on public lands of the ECR to be done by the same individuals or personnel from partner organizations. Monitoring of fish populations will occur annually at a minimum, and most desirably in autumn so both adult populations and seasonal reproductive success may be evaluated. At 5-year intervals, a thorough linear survey of WTC through the HCP area will be conducted. Annual monitoring sites will include ponds and several localities along WTC on private and leased ECR lands. All parties will meet 10 years after permit issuance to determine if the monitoring program is meeting its stated goals.

Monitoring will be done by the Department, the Service, and the Applicant on private lands and by the Department, the Service, and the FS on Forest Service lands. The Department and the Service are co-leads for monitoring. The monitoring will be done by the respective agencies when they have adequate funding and personnel available. When adequate agency funding and personnel are not available, the Applicant will be responsible for insuring that monitoring fish populations on private lands is done. The Applicants' annual expenditure for this monitoring shall not exceed $500. The monitoring will be done by qualified biologists.

The portion of the monitoring plan which deals with emergencies such as drought and non-native species invasion has several purposes. The plan will identify which party to the Agreement is responsible for which actions. All applicable Service policies, current and future, will be implemented.

A variety of techniques determined as on-site conditions dictate will be applied to ensure adequate and efficient collection of multiple species under diverse field conditions. Attempts will be made to apply techniques used for monitoring chub and dace by Service and Department personnel on San Bernardino National Wildlife Refuge (FWS 1994) and elsewhere, so data will be consistent and comparable.

Minimal sampling requirements will include acquisition of data on species composition and relative abundance; catch-per-unit effort will be computed when practicable. Sample effort, season, locations, and techniques will remain consistent over time such that index and

trend data may be derived. Additional sites will be surveyed opportunistically, especially at the times of and after natural or operational changes in the system suspected or known to influence fish habitats and populations. If danger of extirpation exists, partners will be immediately informed and intensive monitoring operations may be employed to evaluate and develop remedial actions.

Monitoring during actions that may cause take shall occur and is the responsibility of the Applicant. Information collected shall include the action taken, how many dead fish of each species were found, and the extent of aquatic habitat (*e.g.,* linear feet of ditch, pond acres) affected. The $500 expenditure limit does not apply to monitoring for take, nor to responding to emergencies.

Information obtained from pertinent monitoring operations will be reported and made available to all partners. Reports will include information from population and take monitoring, and all other actions undertaken to implement the HCP. Reports will be completed annually the first five years of the permit, triennially for the next 15 years, and then every five years for the remainder of the permit. The report completed by the Applicant may vary each year. It will always include an account of incidental take. It may also include other monitoring results, dependent on whether the agencies or the Applicant does the fish and habitat monitoring. Additionally, a cumulative summary report will be produced by a mutually agreeable partner at 5-year intervals following each thorough and linear survey of the WTC system. When the agencies cannot do the reports, the Applicant will be responsible for completion of the reports, subject to the $500 restriction.

## 6.8 ACCESS AND COMMITMENTS FOR COOPERATION

Applicant agrees to allow Agency personnel or their designated representatives access to the ECR when and where necessary to allow for monitoring, sampling, habitat evaluation, and research, including translocation and relocation of fish from place to place as necessary for management purposes, upon reasonable notice and within limits of agreed-upon maintenance, management, and enhancement actions for chub and other species of concern that may occur under current or future circumstances.

## 6.9 FUNDING

The Applicant has sufficient funding to conduct all activities required by the HCP.

## 6.10 UNFORESEEN CIRCUMSTANCES AND AMENDMENT PROCEDURES

The Applicant agrees to meet annually or more frequently if necessary and agreed upon with the Service and partners, to review progress in implementing the HCP and to review needs for amendments because of changing circumstances. Any major change in land

use or natural changes in the watershed that effect species of concern or their habitats should be reported by the Applicant in writing to the designated Service representative, or by that representative or other cooperators in writing to the Applicant as soon as possible.

It is necessary to establish a procedure for amending the Section 10(a)(1)(B) permit. Amendments must be evaluated by all cooperators based on their effects on the habitat, individual species, and permitted actions. The Service must be consulted on all proposed amendments. Concurrence through a consensus will be sought among cooperators before implementation of any amended action. It is understood that unforeseen circumstances will not require the Applicant to provide additional habitats and mitigation above that designated in this agreement nor provide additional compensations above that provided for in this plan, without consent of the Applicant.

Minor amendments involve routine administrative revisions or changes to the operation and management program that do not diminish the level or means of mitigation. Such minor amendments do not alter the terms of the Section 10(a)(1)(B) permit. On written request of the Applicant, the Service is authorized to approve minor amendments to this HCP, if the amendments do not conflict with the primary purpose of this HCP as stated in Section 2.0.

The current "No Surprises" policy (HCP Assurances Rule) of the Service provides that additional mitigation or financial compensation shall not be required of the applicant or their successors beyond the level of mitigation provided in the HCP for the covered species. For the Applicant to be fully covered by the "No Surprises" policy, all requirements identified in the HCP and associated documents must be met and the HCP must be properly implemented. If additional mitigation measures are subsequently deemed necessary to provide for the conservation of a species that was otherwise adequately covered under the terms of a properly functioning HCP, the obligation for such measures shall not rest with the HCP Permittee.

The "No Surprises" policy does not apply if the HCP is not properly implemented, additional species are listed or found to occur within the HCP area, or if unforeseen circumstances occur. The Service must demonstrate that unforeseen circumstances occur. If extraordinary circumstances warrant additional mitigation, such mitigation shall limit changes to the original HCP to the maximum extent possible and shall be limited to modifications within the HCP's operating conservation program for the affected species, and maintain the original terms of the conservation plan as much as possible. Nothing in the "No Surprises" Policy shall be construed to limit or constrain the Service or any other governmental entity from taking additional actions at its own expense to protect or conserve a species included in an HCP, subject to landowner approval.

# 7.0 CONSULTATION AND COORDINATION WITH OTHERS

This is a list of individuals involved with developing or reviewing this EA/HCP:

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## APPENDIX A. Scientific names for organisms mentioned in text.

Indigenous species

| | |
|---|---|
| Beautiful shiner | *Cyprinella formosa* |
| Longfin dace | *Agosia chrysogaster* |
| Mexican stoneroller | *Campostoma ornatum* |
| Yaqui catfish | *Ictalurus pricei* |
| Yaqui chub | *Gila purpurea* |
| Yaqui topminnow | *Poeciliopsis occidentalis sonoriensis* |
| Mexican spotted owl | *Strix occidentalis lucida* |
| Chiricahua leopard frog | *Rana chiricahuensis* |

Non-indigenous species

| | |
|---|---|
| Bluegill | *Lepomis macrochirus* |
| Channel catfish | *Ictalurus punctatus* |
| Fathead minnow | *Pimephales promelas* |
| Green sunfish | *Lepomis cyanellus* |
| Largemouth bass | *Micropterus salmoides* |
| Western mosquitofish | *Gambusia affinis* |
| Rainbow trout | *Oncorhynchus mykiss* |
| | |
| Bullfrog | *Rana catesbeiana* |
| Tiger salamander | *Ambystoma tigrinum* |

# APPENDIX B
## Coordinated Land Management Plan for the ECR.